

# Report on the FCC and IC Testing of the SEW-EURODRIVE GmbH & Co KG

Model: MAXO-MS/M/SM-GIP/2

In accordance with FCC 47 CFR Part 15 C  
and ISED RSS-GEN and ISED RSS-102

Prepared for: SEW-EURODRIVE GmbH & Co KG  
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Product Service

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## COMMERCIAL-IN-CONFIDENCE

Date: 2025-03-20

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| RESPONSIBLE FOR      | NAME           | DATE       | SIGNATURE  |
|----------------------|----------------|------------|--|
| Project Management   | Michael Ingerl | 2025-03-20 | <br>SIGN-ID 1029107 |
| Authorised Signatory | Martin Steindl | 2025-03-20 | <br>SIGN-ID 1029228 |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

### Engineering Statement:

These measurements shown in this report were made in accordance with the procedures described on test pages.  
All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15 C and ISED RSS-102 and RSS-GEN.

The sample tested was found to comply with the requirements in the tested parts

| RESPONSIBLE FOR | NAME           | DATE       | SIGNATURE  |
|-----------------|----------------|------------|--|
| Testing         | Michael Ingerl | 2025-03-20 | <br>SIGN-ID 1029107 |

Laboratory Accreditation  
DAkkS Reg. No. D-PL-11321-11-03  
DAkkS Reg. No. D-PL-11321-11-04

Laboratory recognition  
Registration No. BNetzA-CAB-16/21-15

Industry Canada test site registration  
3050A-2

### Executive Statement:

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15 C:2023 and ISED RSS-102:2023 and ISED RSS-Gen:2018 + A1:2019 + A2:2021 in the tested parts

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## 1 Report Summary

### 1.1 Modification Report

Alternations and additions of this report will be issued to the holders of each copy in the form of a complete document.

| Revision | Description of changes | Date of Issue |
|----------|------------------------|---------------|
| 0        | First Issue            | 2025-03-20    |

Table 1: Report of Modifications

### 1.2 Introduction

|                          |                                     |
|--------------------------|-------------------------------------|
| Applicant                | SEW-EURODRIVE GmbH & Co KG          |
| Manufacturer             | SEW-EURODRIVE GmbH & Co KG          |
| Model Number(s)          | MAXO-MS/M/SM-GIP/2                  |
| Serial Number(s)         | ---                                 |
| Hardware Version(s)      | ---                                 |
| Software Version(s)      | ---                                 |
| Number of Samples Tested | 1                                   |
| Test Specification(s) /  | FCC 47 CFR, Part 1, § 1.1307: 2023, |
| Issue / Date             | ISED RSS-102, Issue 6: 2023         |
| Test Plan/Issue/Date     | ---                                 |
| Order Number             | 62351943                            |
| Date                     | 2024-11-21                          |
| Date of Receipt of EUT   | 2025-01-14                          |
| Start of Test            | 2025-02-26                          |
| Finish of Test           | 2025-02-26                          |
| Name of Engineer(s)      | Michael Ingerl                      |
| Related Document(s)      | ANSI C63.10:2020                    |



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR, Part 1, § 1.1310 and ISED RSS-102 is shown below.

| Section | Specification Clause | Test Description      | Result |
|---------|----------------------|-----------------------|--------|
| 2.1     | (e)(1)               | RF Exposure Exemption | Pass   |

Table 2: Results according to FCC 47 CFR, Part 1, § 1.1310

| Section | Specification Clause | Test Description      | Result |
|---------|----------------------|-----------------------|--------|
| 2.1     | 5                    | RF Exposure Exemption | Pass   |

Table 3: Results according to ISED RSS-102



## 1.4 Product Information

### 1.4.1 Technical Description

The EUT is a NFC Reader that works at 13.56 MHz.

*Frequency Band:* 13.553 MHz to 13.567 MHz

*Center Frequency:* 13.56 MHz

*Power supply*

*Supply Voltage:* 24 V

*Supply Frequency:* DC

## 1.5 Test Configuration

The EUT was 24 V power supplied.

## 1.6 Modes of Operation

Continuously reading tag.

## 1.7 Deviations from Standard

---



## 1.8 EUT Modifications Record

The table below details modifications made to the EUT during the test program.  
The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State | Description of Modification still fitted to EUT | Modification Fitted By | Date Modification Fitted |
|--------------------|---|------------------------|--------------------------|
| 0                  | As supplied by the customer                     | Not Applicable         | Not Applicable           |

Table 4

## 1.9 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing test laboratory:

| Test Name   | Name of Engineer(s) |
|-------------|---------------------|
| RF Exposure | Michael Ingerl      |

**Office Address:**

Äußere Frühlingstraße 45  
94315 Straubing  
Germany



## 2 Test Details

### 2.1 RF Exposure Exemption

#### 2.1.1 Specification Reference

47 CFR, Part 1, § 1.1310  
RSS-102, Issue 6 (2023-12-15)

#### 2.1.2 Equipment under Test and Modification State

MAXO-MS/M/SM-GIP/2; S/N ---; Modification state 0

#### 2.1.3 Date of Test

2025-02-26

#### 2.1.4 Environmental Conditions

|                     |       |
|---------------------|-------|
| Ambient Temperature | 22 °C |
| Relative Humidity   | 40 %  |



## 2.1.5 Specification Limits

### 47 CFR, Part 1, § 1.1307(b)(3)

- (i) For single RF sources (i.e. any single fixed RF source, mobile device, or portable device, as defined in paragraph(b)(2) of this section): A single RF source is exempt if:
  - (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
  - (B) Or the available maximum time-averaged power or effective radiate power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by

$$P_{th}(\text{mW}) = \begin{cases} ERP_{20\text{cm}} (d/20\text{ cm})^x, & d \leq 20\text{ cm}; \\ ERP_{20\text{cm}}, & 20\text{ cm} < d \leq 40\text{ cm} \end{cases}$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20\text{cm}} \sqrt{f}} \right); f \text{ in GHz}$$

and

$$ERP_{20\text{cm}}(\text{mW}) = \begin{cases} 2040f, & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060, & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

$d$  = the test separation distance (cm);

- (C) Or using the table below and the minimum separation distance ( $R$  in meters) from the body of a nearby person for the frequency ( $f$  in MHz) at which the source operates, the ERP (watts) is no more than the calculated value described for that frequency. For the exemption in the table to apply,  $R$  must be at least  $\lambda/2\pi$  where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

| RF source frequency (MHz) | Threshold ERP (Watts) |
|---------------------------|-----------------------|
| 0.3 – 1.34                | $1920 R^2$            |
| 1.34 – 30                 | $3450 R^2 / f^2$      |
| 30 – 300                  | $3.83 R^2$            |
| 300 – 1500                | $0.0128 R^2 f^2$      |
| 1500 – 100000             | $19.2 R^2$            |

- (ii) For multiple RF sources: Multiple RF sources are exempt if:
  - (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of 2 cm between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
  - (B) In case of fixed RF sources operating in the same time-averaging period, or of multiple or portable RF sources within a device in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{ExposureLimit_k} \leq 1$$



**47 CFR, § 1.1310, Table 1 (ii)**

| Frequency range (MHz) | Electric Field (V rms) | Magnetic field (A/m rms) | Power density (W/m <sup>2</sup> ) | Reference period (min) |
|-----------------------|------------------------|--------------------------|-----------------------------------|------------------------|
| 0.3 – 1.34            | 614                    | 1.63                     | 100                               | < 30                   |
| 1.34 – 30             | 824 / f                | 2.19 / f                 | 180 / f <sup>2</sup>              | < 30                   |

**RSS-102, section 6.3**

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the table below:

| f (MHz) | Exemption Limits (mW) at separation distance of |       |       |       |       |       |       |       |       |         |
|---------|---|-------|-------|-------|-------|-------|-------|-------|-------|---------|
|         | ≤ 5 mm  | 10 mm | 15 mm | 20 mm | 25 mm | 30 mm | 35 mm | 40 mm | 45 mm | ≥ 50 mm |
| ≤ 300   | 45  | 116   | 139   | 163   | 189   | 216   | 246   | 280   | 319   | 362     |
| 450     | 32  | 71    | 87    | 104   | 124   | 147   | 175   | 208   | 248   | 296     |
| 835     | 21  | 32    | 41    | 54    | 72    | 96    | 129   | 172   | 228   | 298     |
| 1900    | 6   | 10    | 18    | 33    | 57    | 92    | 138   | 194   | 257   | 323     |
| 2450    | 3   | 7     | 16    | 32    | 56    | 89    | 128   | 170   | 209   | 245     |
| 3500    | 2   | 6     | 15    | 29    | 50    | 72    | 94    | 114   | 134   | 158     |
| 5800    | 1   | 5     | 13    | 23    | 32    | 41    | 54    | 74    | 102   | 128     |

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for route evaluation are multiplied by a factor of 5. For limb-worn devices where the 10 grams value applies, the exemption limits for routine evaluation are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implant device is defined as the higher of the conducted or e.i.r.p. to determine whether the device is exempt from the SAR evaluation.

**RSS-102, Table 7**

| Frequency range (MHz) | Electric Field (V rms) | Magnetic field (A/m rms) | Power density (W/m <sup>2</sup> ) | Reference period (min) |
|-----------------------|------------------------|--------------------------|-----------------------------------|------------------------|
| 10 – 20               | 27.46                  | 0.0728                   | 2                                 | 6                      |



## 2.1.6 Test Method

The RF Exposure is based on a E and H-Fields measurement at a test distance of 20cm.

## 2.1.7 Test Results

### 47 CFR

Evaluation according to 47 CFR, Part 1, § 1.1310 table 1 (ii).

| Frequency [MHz] | Electric Field Strength [V/m] | Magnetic Field Strength [A/m] | Limit [V/m] | Limit [A/m] | Margin |
|-----------------|-------------------------------|-------------------------------|-------------|-------------|--------|
| 13.56           | 0.29                          | ---                           | 60.77       | ---         | 60.48  |
| 13.56           | ---                           | 0.0233                        | ---         | 0.1615      | 0.1382 |

### RSS-102

Evaluation according to RSS 102 table 7.

| Frequency [MHz] | Electric Field Strength [V/m] | Magnetic Field Strength [A/m] | Limit [V/m] | Limit [A/m] | Margin |
|-----------------|-------------------------------|-------------------------------|-------------|-------------|--------|
| 13.56           | 0.29                          | ---                           | 27.46       | ---         | 27.17  |
| 13.56           | ---                           | 0.0233                        | ---         | 0.0728      | 0.0495 |

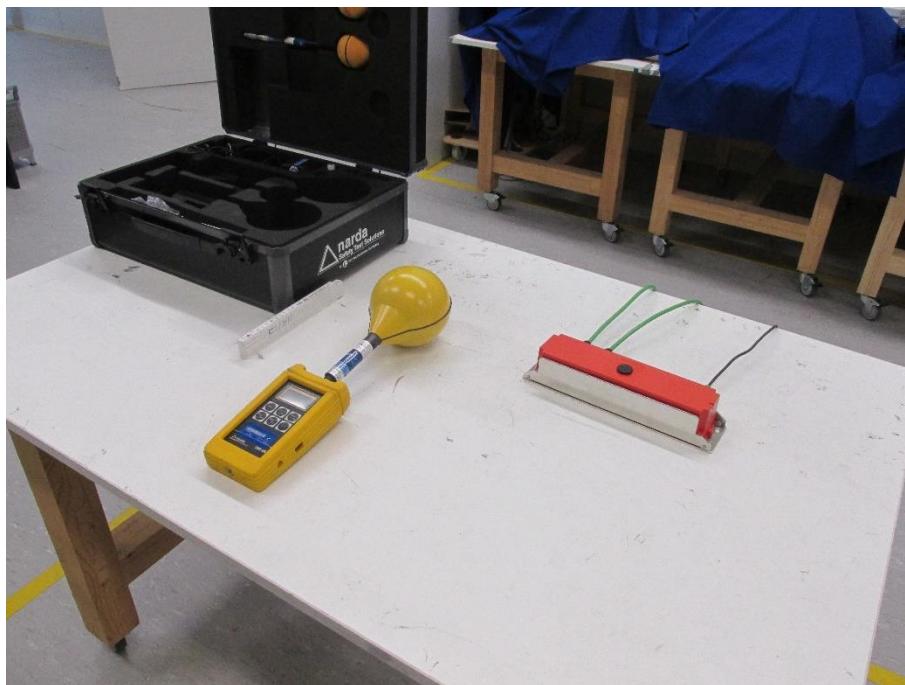


## 2.1.8 Test Location and Test Equipment

The test was carried out in a non shielded room.

| <i>Instrument</i>               | <i>Manufacturer</i> | <i>Type No</i> | <i>TE No</i> | <i>Calibra-tion Pe-riod<br/>(months)</i> | <i>Calibration Due</i> |
|---------------------------------|---------------------|----------------|--------------|--|------------------------|
| Electromagnetic radiation meter | Narda               | EMR-200        | 19590        | 36                                       | 2025-12-31             |
| Electric field probe            | Narda               | Type 8.3       | 19591        | 36                                       | 2025-12-31             |
| Magnetic field probe            | Narda               | Type 12.1      | 19592        | 36                                       | 2025-12-31             |

### 3 Photographs of Test Setups



## 4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

The measurement uncertainty in the laboratory is less than or equal to the maximum measurement uncertainty according to CISPR16-4-2: 2011 + A1 + A2 + Cor1 ( $U_{CISPR}$ ). This normative regulation means that the measured value is also the value to be assessed in relation to the limit value.

| Radio Interference Emission Testing      |       |                      |
|--|-------|----------------------|
| Test Name                                | $k_p$ | Expanded Uncertainty |
| Conducted Voltage Emission               |       |                      |
| 9 kHz to 150 kHz (50Ω/50µH AMN)          | 2     | ± 3.8 dB             |
| 150 kHz to 30 MHz (50Ω/50µH AMN)         | 2     | ± 3.4 dB             |
| 100 kHz to 200 MHz (50Ω/5µH AMN)         | 2     | ± 3.6 dB             |
| Discontinuous Conducted Emission         |       |                      |
| 9 kHz to 150 kHz (50Ω/50µH AMN)          | 2     | ± 3.8 dB             |
| 150 kHz to 30 MHz (50Ω/50µH AMN)         | 2     | ± 3.4 dB             |
| Conducted Current Emission               |       |                      |
| 9 kHz to 200 MHz                         | 2     | ± 3.5 dB             |
| Magnetic Field strength                  |       |                      |
| 9 kHz to 30 MHz (with loop antenna)      | 2     | ± 3.9 dB             |
| 9 kHz to 30 MHz (large-loop antenna 2 m) | 2     | ± 3.5 dB             |
| Radiated Emission                        |       |                      |
| 30 MHz to 300 MHz                        | 2     | ± 4.9 dB             |
| 300 MHz to 1 GHz                         | 2     | ± 5.0 dB             |
| 1 GHz to 6 GHz                           | 2     | ± 4.6 dB             |
| Test distance 10 m                       |       |                      |
| 30 MHz to 300 MHz                        | 2     | ± 4.9 dB             |
| 300 MHz to 1 GHz                         | 2     | ± 4.9 dB             |

The expanded uncertainty reported according to CISPR16-4-2: 2011 + A1 + A2 + Cor1 is based on a standard uncertainty multiplied by a coverage factor of  $k_p = 2$ , providing a level of confidence of  $p = 95.45\%$

Table 5 Measurement uncertainty based on CISPR 16-4-2



| Radio Interference Emission Testing   |           |                      |
|---|-----------|----------------------|
| Test Name   | <i>kp</i> | Expanded Uncertainty |
| Occupied Bandwidth  | 2         | $\pm 5\%$            |
| Conducted Power   |           |                      |
| $9\text{ kHz} \leq f < 30\text{ MHz}$   | 2         | $\pm 1.0\text{ dB}$  |
| $30\text{ MHz} \leq f < 1\text{ GHz}$   | 2         | $\pm 1.5\text{ dB}$  |
| $1\text{ GHz} \leq f \leq 40\text{ GHz}$  | 2         | $\pm 2.5\text{ dB}$  |
| 1 MS/s power sensor (TS8997)  | 2         | $\pm 1.5\text{ dB}$  |
| Occupied Bandwidth  | 2         | $\pm 5\%$            |
| Power Spectral Density  | 2         | $\pm 3.0\text{ dB}$  |
| Radiated Power  |           |                      |
| $9\text{ kHz} \leq f < 26.5\text{ GHz}$   | 2         | $\pm 5.6\text{ dB}$  |
| $26.5\text{ GHz} \leq f < 60\text{ GHz}$  | 2         | $\pm 8.0\text{ dB}$  |
| $60\text{ GHz} \leq f < 325\text{ GHz}$   | 2         | $\pm 10\text{ dB}$   |
| Conducted Spurious Emissions  | 2         | $\pm 3.0\text{ dB}$  |
| Radiated Spurious Emissions   | 2         | $\pm 6.0\text{ dB}$  |
| Voltage   |           |                      |
| DC  | 2         | $\pm 1.0\%$          |
| AC  | 2         | $\pm 2.0\%$          |
| Time (automatic)  | 2         | $\pm 5\%$            |
| Frequency   | 2         | $\pm 10^{-7}$        |
| The expanded uncertainty reported according to ETSI TR 100 028:2001 is based on a standard uncertainty multiplied by a coverage factor of <i>kp</i> = 2, providing a level of confidence of <i>p</i> = 95.45% |           |                      |

Table 6 Measurement uncertainty based on ETSI TR 100 028